

REMARKS

This application pertains to a novel combination static mixer/heat exchanger.

Claims 1-21 are pending.

Claims 1-21 stand rejected under 35 U.S.C. 112, first paragraph, because the Examiner sees no support for the recitation "at least two tubes...closed to the product space". In addition, the Examiner reads the specification as teaching away from this limitation, referring specifically to the language at page 12, lines 15-19.

The language referred to by the Examiner at page 12, lines 15-19, relates to one embodiment of the present invention, wherein at least one tube passes through the heat transfer medium supply or discharge regions, and has openings through which additional reactants can be supplied to the product flowing through the mixer/heat exchanger. This is an extra feature; namely a feed tube through which reactants can be added to the product side of the heat exchanger. Note that the tube in question passes through the heat transfer media supply or discharge area, and therefore does not carry heat transfer media. This is not a substitute for the claimed heat transfer tubes, but just a further feature which is present in addition to the heat transfer tubes. This language clearly does not in any way "teach away" from the heat exchange tubes being isolated from the product side of the heat exchanger.

It is respectfully pointed out that the subject matter of the claim need not be

described literally (i.e., using the same terms or *in haec verba*) in order for the disclosure to satisfy the description requirement.

It is also respectfully pointed out that what is conventional or well known to one of ordinary skill in the art need not be disclosed in detail. If a skilled artisan would have understood the inventor to be in possession of the claimed invention at the time of filing, even if every nuance of the claims is not explicitly described in the specification, then the adequate description requirement is met (see MPEP 2163(II)(A)(3)(a)).

Moreover, there is an inverse correlation between the level of skill and knowledge in the art and the specificity of disclosure necessary to satisfy the written description requirement. Information which is well known in the art need not be described in detail in the specification (see MPEP 2163(II)(A)(2)).

At page 6, lines 15-20, Applicants disclose that:

"According to the invention, these and other objects are achieved by a static mixer/heat exchanger for the treatment of viscous and highly viscous products, comprising at least one housing, the temperature of which can optionally be controlled, for the product to pass through, in which housing at least two tubes whose temperature can be controlled, in particular by passing a heat-transfer medium through them..."

Those skilled in the art, such as chemical engineers, are very familiar with heat exchangers, and understand that the tubes of a heat exchanger comprising a housing and tubes whose temperature can be controlled by passing a heat transfer medium

through them are and must be closed to the interior of the housing. The heat transfer medium will be understood as staying within the interior of the tubes (i.e., the “tube side”), whereas the product to be heated remains within the housing, outside of the tubes, and flows over the tubes, to be heated or cooled. Every person skilled in the art understands that the heat transfer medium is kept isolated from the product being heated, and that the heat-transfer tubes do not have holes in them that would allow the heat transfer medium to contaminate the product being heated.

Referring again to the language cited by the Examiner at page 12, lines 15-19, it is respectfully pointed out that the entire paragraph must be read in order to understand the correct meaning of the cited language. The paragraph reads as follows:

A particularly preferred mixer/heat exchanger structure is characterized in that at least one tube with fins in one plane is guided on one side, by means of a tube extension, through the supplying or discharging temperature-control region to outside the housing, and the passage in the finned tube is closed on one side, and at least two radial openings form a connection from the passage in the finned tube to the product space of the mixer/heat exchanger, through which medium flows, in order to carry an additional liquid or gaseous component into the main flow of the material being mixed and to directly mix this component with the material

The Examiner will note that this paragraph refers to a tube which, by means of a tube extension, is guided through the temperature control region to outside the housing... and is closed at the other end, and has openings that form a connection from the tube into the product space. This is clearly a feed tube, not a heat transfer tube,

and is an option that may be present in addition to the closed-circuit heat transfer tubes.

Just as the Examiner argues that a photo of the Sahara Desert does not prove that the Earth has no oceans, the presence of a feed tube in the static mixer/ heat exchanger does not mean that the static mixer/heat exchanger has no heat transfer tubes which are closed to the product space.

At page 11, lines 24-29, Applicants disclose heat conduction from the temperature-control agent flowing through to the outer surface which is in contact with the product.... This clearly describes a temperature control agent flowing inside the tubes, which transfers heat through the tubes to the product flowing over the outside surfaces of the tubes. Those skilled in the art would clearly understand that such tubes are closed to the product space. That is how heat exchangers work!

The original specification clearly shows that Applicants had possession of the concept of the tubes being closed to the product space, because every person skilled in the art reading the specification and drawings in their entirety will understand that the disclosed heat exchanger which "comprises" a housing and tubes will have tubes that are closed to the interior of the housing, as the concept of heat transfer tubes is a very basic concept, and it is well-understood by all chemical engineers that a heat exchanger tube is closed to the product space which contains the product to be heated or cooled by transfer of heat from the media within the tubes to the product outside the

tubes by passing heat energy through the walls of the tubes while the heat transfer media itself is kept isolated from the product., and they will also recognize that the mere fact that the heat exchanger may further “comprise” a feed tube for injecting a substance into the product in the product space does not detract in any way from the presence of the heat exchanger tubes which are closed to the interior of the housing.

The feed tube is further described in Example 5 (at page 24), and in figure 14. From the Example and the drawings, the Examiner will see that the feed-tube 13, which is in between two heat transfer tubes, and has openings 14, projects through the heat transfer medium chamber through to the outside of the housing and is open on one end to the outside of the housing. The other end of the tube 13 is closed off. Clearly, this tube is not a heat transfer tube, as it does not communicate with either the heat transfer inlet chamber or the heat transfer discharge chamber. The mere fact that this “feed tube” 13 is present, does not mean that the two heat transfer tubes, shown on either side of the feed tube and communicating with the heat transfer medium chambers, are not present.

The rejection of claims 1-21 under 35 U.S.C. 112, first paragraph should accordingly be withdrawn.

In view of the present amendments and remarks it is believed that claims 1-21 are now in condition for allowance. Reconsideration of said claims by the Examiner is respectfully requested and the allowance thereof is courteously solicited.

CONDITIONAL PETITION FOR EXTENSION OF TIME

If any extension of time for this response is required, Applicants request that this be considered a petition therefor. Please charge the required petition fee to Deposit Account No. 14-1263.

ADDITIONAL FEE

Please charge any insufficiency of fee or credit any excess to Deposit Account No. 14-1263.

Respectfully submitted,
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